the development of lakes during the Last Glacial and changes in the level regime of lakes in northern Eurasia (Harrison et al., 1996).

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NEW DATA ON BALTIC SEA RELATIVE LEVEL CHANGES DURING HOLOCENE WITHIN HOGLAND (SUURSAARI) ISLAND, GULF OF FINLAND

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Introduction

Hogland Island (or Suursaari) is located in the center of Gulf of Finland (60.056°N 26.983°E) about 40 km away from the coast of Finland, 55 km away from Estonia and 180 km away of Saint Petersburg (Fig. 1). The island is elongated from NNW to SSE for about 11 km, its maximum width is 3 km.

The relief of the island is abnormally high among the islands of Gulf of Finland and the surrounding mainland. There are four well distinguished peaks elevated from 108 to 175 meters above present Baltic Sea level (Fig. 2). Verzilin & Oknova (2006) report some evidences of intense vertical and horizontal movements that suggested to be produced by earthquakes. But previous geomorphic investigations and geodetic levelling (Sauramo (1958)) revealed the presence of an identical set of ancient Baltic Sea shores, composed mainly of coarse well-rounded material, on the same heights throughout Hogland. Therefore, it could be supposed that Holocene coastal forms are affected only by glacio-isostatic movements.

Precambrian bedrock outcrops are exposed all over the island, therefore quaternary deposits consist generally of described ancient coastal forms and of lake and mire bottom sediments (Puura et al. (1992)), which makes them a valuable object for paleoenvironmental studying.

The first attempt to correlate ancient shorelines with Baltic Sea post-glacial stages was made by Berghell (1986), but it did not include any microfossil evidences. Thus, some more studies on diatom (Heinsalu (1997)), pollen (Veski et al., (1995)) and multi-proxy analysis (Heinsalu et al. (2000)) of bottom sediments concerning the isolation of inland water bodies from the sea were reported.

These studies included the investigation of the top-most mire and lakes. The results show that sedimentation in the mire started in the late Allerød, while the lakes were isolated during Ioldia Sea stage from around 10 to 9.5 ka BP.

Fig. 1. Location of study site (Hogland, or Suursaari, Island)

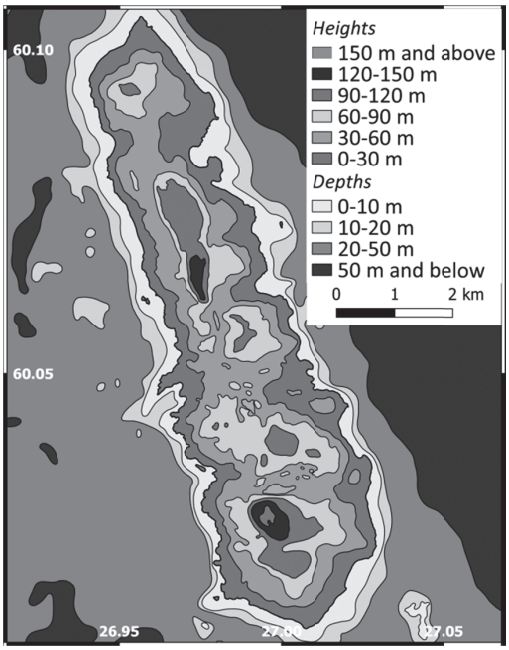

Fig. 2. Hypsometric map of Hogland (Suursaari) Island

Materials and methods

New lake sediment sequences from two unprobed earlier inferior lakes of the island (Fig. 3) were collected by using a Russian peat corer by a paleolimnology group from Institute of Limnology (Russian Academy of Sciences).

The first probed lake called Lounatjärvi is the largest lake of the island and lays c. 45 meters above present Baltic sea level (60.0317°N 26.9950°E). Four cores were collected, maximum thickness of deposits taken is 2.1 m. Lower parts of the cores consist of coarse sand followed by a thin layer of fine sand. Sands are superposed by clay gyttja and, in the upper part, by organic gyttja.

The second lake called Pahalampi (60.0350°N 27.0088°E) is, in contrast, the smallest and very shallow lake, surrounded by quagmire. It is at c. 55 meters a. s. l., overall thickness of deposits taken – 4.95 m. Lower part of the cores consist also of coarse sand followed by a thin sandy clay layer, superposed by clay gyttja, then by organic gyttja which gradually changes upwards to peat.

Conclusion

Cores taken from two lakes are intended for multi-proxy paleogeographical analysis. At this time, litho-stratigraphic analysis is made and radiocarbon (AMS) dating, pollen and diatom studies were started.

It is expected that this research will provide data on vegetation and landscape transformation in early to middle Holocene which will make possible to reconstruct climatic parameters during this period. Dates of moments of lakes isolation from Baltic Sea will make its contribution in correlating of different relative sea level curves (and glacioisostatic adjustment patterns as well) from Northern Estonia, Southern Finland and North-Western Russia.

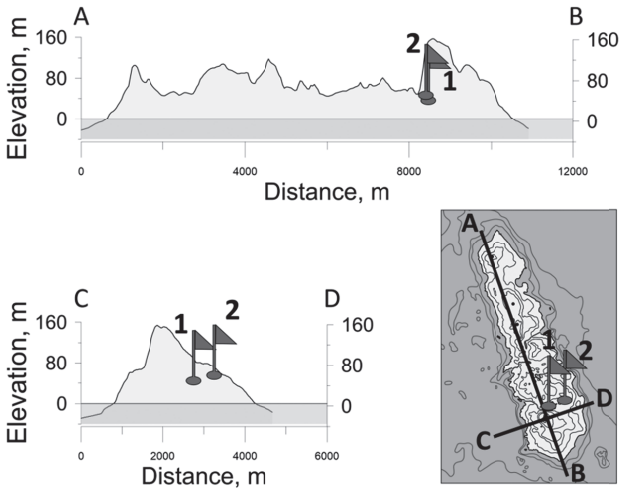

Fig. 3. Location of new coring sites: 1 – Lounatjärvi Lake, c. 45 m a. s. l., 2 – Pahalampi Lake, c. 55 m a. s. l.

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